

PROCEDURES GENERATION PACKAGE

June 22, 1984

COOPER NUCLEAR STATION

NEBRASKA PUBLIC POWER DISTRICT

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Attachments

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| Guideline for Preparation of    |  |    |
| Operating Procedures,           |  |    |
| Cooper Nuclear Station, Rev. 0, |  |    |
| April 25, 1984.                 |  |    |

I. INTRODUCTION

The purpose of this Procedures Generation Package (PGP) is to describe the emergency operating procedure (EOPs) development at Cooper Nuclear Station (CNS). This document was developed in response to Supplement 1 to NUREG-0737, Item 7.2b, page 15.

## II. PLANT-SPECIFIC TECHNICAL GUIDELINES

### GENERAL

The following program describes the program for converting the General Electric (GE) Boiling Water Reactor Owner's Group (BWROG) Emergency Procedure Guidelines (EPGs) for GE-BWR 1 through 6 designs into EOPs for CNS.

The GE/BWROG EPG, Revision 3I (dated March 1984) was used for development of the initial CNS EOPs. Revision 3I includes improvements by the BWROG Emergency Procedures Committee to Revision 3 (approved by the NRC) which will appear in Revision 4, due for NRC review at the end of 1984. Differences between Revisions 3 and 3I and their technical justification are documented separately.

When subsequent revisions to the EPGs are approved for implementation by the U.S. Nuclear Regulatory Commission, the revised information will be incorporated into the EOPs using the established revision, review and approval process.

### PROGRAM DESCRIPTION

The following plant-specific technical and source information was used in generation of the CNS EOPs:

- o GE/BWROG EPG, Revision 3I dated March 1984
- o USAR
- o Technical Specifications
- o Existing EOPs
- o As-built plant drawings
- o Equipment manuals
- o Emergency Operating Procedures Writing Guideline (INPO 82-017)
- o Guidelines for the Preparation of Emergency Operating Procedures (NUREG-0899)

The EOPs were developed by following the EPGs step-by-step adding plant-specific information, details and nomenclature as required. The EPGs are generic to GE-BWR 1 through 6 designs in that they address all major systems which may be used to respond to an emergency. Because no specific plant includes all of the systems in these guidelines, the guidelines are applied to individual plants by deleting statements which are not applicable or by substituting equivalent systems where appropriate. For example, since CNS does not have HPCS, IC or SPMS systems, these were deleted. Likewise, CNS has a Mark I primary containment design and all actions applicable to Mark II and III primary containment designs were deleted. Additionally, the EPGs contain in some cases a general category of system which is bracketed, (i.e., [Other steam driven equipment]) or a bracketed list of systems, dependent on plant design, that potentially could be used for a given action. The EPG Appendices provide the direction necessary to apply the bracketed information to the plant-specific EOPs. Where a list of systems appropriate for a given action was identified, the corresponding CNS systems were incorporated into the EOPs. In other cases where the best choice of systems was suggested, these were evaluated and the one or two most appropriate for CNS were used. Since the technical basis for the EPGs are generic to GE-BWR 1 through 6 designs using the implementation criteria described above, this method for developing the CNS EOPs is technically justified.

As part of the Verification Program, agreement between the GE/BWROG EPG and CNS EPG is documented along with the basis for any changes on a form similar to Figure 1. Likewise, agreement between the CNS EPG and EOPs is documented using a similar form.

FIGURE 1

Page \_\_\_ of \_\_\_

STEP DOCUMENTATION

Draft Document: \_\_\_\_\_

Source Document: \_\_\_\_\_

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| DRAFT<br>STEP | SOURCE<br>STEP | DEVIATION<br>FROM SOURCE |    | BASIS FOR DEVIATION |
|---------------|----------------|--------------------------|----|---------------------|
|               |                | YES                      | NO |                     |
| <hr/>         |                |                          |    |                     |
| <hr/>         |                |                          |    |                     |

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Writer: \_\_\_\_\_ Date \_\_\_\_\_

Brackets [ ] within the EPGs enclose plant unique setpoints, design limits, pump shutoff pressures, etc. Parentheses ( ) within brackets indicate the source for the bracketed variable. The bracketed values were obtained for the CNS EOPs in the following manner. Some of the plant unique setpoints are obtained from the CNS technical and source information summarized previously such as the Technical Specifications. Some of the action levels and curves are calculated values based on EPG, Appendix C, "Calculational Procedures". A list of the plant specific data required for these calculations and the source of this data was generated as part of the EOP documentation.

A walk-through of the EOPs was made through the CNS control room to confirm that:

- o Instrumentation was available to implement the actions in the EOPs
- o The action levels were within the range of the installed instrumentation
- o The action levels could be read on the installed instrumentation
- o The action level units were in agreement with the installed instrumentation
- o The nomenclature in the EOPs were in agreement with installed nomenclature on the control room panels

Discrepancies were corrected in the EOPs.

### III. WRITER'S GUIDE FOR EOPs

#### GENERAL

The Writer's Guide provides detailed instructions on how to prepare EOPs using sound writing principles. Its recommendations address all aspects of writing procedures from a human factors standpoint. Compliance with the CNS Writer's Guide helps ensure all EOPs are complete, accurate, and readable to control room personnel. This also ensures conformity of format and style for future revisions to the procedures.

#### DOCUMENT DESCRIPTION

The CNS Writer's Guide consists of technical and administrative information which is used to generate concise and precise instructions with a uniform text arrangement.

General and specific guidance for preparation of the EOPs is addressed in the Writer's Guide as follows:

- o Procedure designation and numbering
- o Procedure organization and format
- o Procedure preparation and content
- o Mechanics of style
- o Typing format
- o Reproduction
- o Binding



The Writer's Guide will be revised as necessary, based on training feedback, operating experience, and the results of the verification/validation programs. The CNS EOP Writer's Guide is based on:

- o Emergency Operating Procedures Writing Guideline (INPO 82-017), developed by the Emergency Operating Procedures Implementation Assistance (EOPIA) Review Group and published by INPO
  
- o Guidelines for the Preparation of Emergency Operating Procedures (NUREG-0899)

The CNS Writer's Guide is presented in Attachment 1.

#### IV. EOP VERIFICATION PROGRAM

##### GENERAL

EOP verification is the evaluation performed to confirm the written correctness of the procedure and to ensure that applicable generic and plant-specific technical information has been incorporated properly. This evaluation also checks that the human factors aspects presented in the EOP Writer's Guide have been applied. The verification program is based on the industry document Emergency Operating Procedures Verification Guideline (INPO 83-004), developed by the EOPIA Review Group and published by INPO.

##### PROGRAM DESCRIPTION

The EOP Verification Program encompasses the efforts necessary to support a comparative evaluation of EOP to source documentation. In developing a process to fulfill this objective the following elements were included:

- o Plant-specific calculations used in the upgraded EOPs are verified by an independent engineering organization
- o A Human Factors Engineer conducts a review of the EOPs and the EOP Writer's Guide
- o Agreement between the EOPs and the EPG is documented along with the basis for any changes
- o Control room walk-throughs of the EOPs are performed to confirm:
  - a. EOP nomenclature agrees with equipment nameplate, and
  - b. Actions levels can be read on installed instrumentation

- o An NPPD Licensing and/or Quality Assurance review of the EOP program
- o Each upgraded EOP is submitted for formal review in accordance with the established CNS procedures

Satisfactory completion of the CNS Verification Procedure for Emergency Operating Procedures will provide a record of activities during the program process. Discrepancies found during the evaluation will also be documented along with the resolution for each discrepancy.

## V. EOP VALIDATION PROGRAM

### GENERAL

EOP validation is the evaluation performed to determine that the actions specified in the procedure can be performed by the operator to manage emergency conditions effectively. The methodology for EOP validation utilizes presently available methods at CNS while recognizing and allowing for future improvements. The EOP validation will evaluate the operator's ability to manage emergency conditions using the EOPs. It will validate those parts of the EOPs not covered by a technical validation of generic technical guidelines. The program is based on the industry document Emergency Operating Procedures Validation Guideline (INPO 83-006), developed by the EOPIA Review Group and published by INPO.

### PROGRAM DESCRIPTION

In developing the EOP validation program, several methods of validation were considered:

- o Generic simulator sessions
- o Control room walk-throughs
- o Desk top reviews
- o Seminars/workshops

Although each of the methods will yield useful information about the EOPs, it is believed that control room walk-throughs and sessions on a generic simulator will best establish the accuracy of the EOPs and demonstrate that the procedures will effectively mitigate transients and accidents.

The program will be implemented by a team comprised of:

- o CNS personnel
- o A General Electric Company advisor
- o A Human Factors consultant

The team will select and develop scenarios which best exercise each EOP. In selecting the scenarios, emphasis will be placed on human engineering factors as well as technical adequacy. The scenarios will be developed to guide the operator through anticipated procedure steps so that the evaluation criteria can be addressed. The team will note expected versus actual responses to EOP actions in order to identify potential problems with the EOPs. They will evaluate operator feedback and provide disposition to procedural discrepancies. It is recognized that some problems may require revision to the EOPs. In such cases, the validating team will determine the extent to which the revised EOP must again be verified/validated. Completion of the CNS Validation Procedure for Emergency Operating Procedures will fully document the above process.

EOP validation will be performed prior to the Training Program discussed in Section VI.

## VI. EOP TRAINING PROGRAM

### GENERAL

The EOP training program is designed to support implementation of the EOPs. The training is closely tied to the verification and validation of the EOPs to ensure a supportive program. The underlying goals are to enable the operator to:

- o Understand the structure and technical bases of the EOPs
- o Develop a working knowledge of the EOPs
- o Use the EOPs under adverse operational conditions

This training program will also point out any problems with the new emergency procedures enabling revision and refinement before they are fully implemented in the plant. The following description outlines the approach used to train licensed operators on the EOPs and to ensure the operators are informed and knowledgeable of future changes to the EOPs.

### PROGRAM DESCRIPTION

The initial training effort consists of classroom instruction, control room walk-throughs and simulator exercises. In the classroom sessions lectures will be presented which are based on the BWR Emergency Procedure Guidelines Appendix B, "Detailed Discussion of Cautions and Operator Actions". These are specifically tailored to the CNS plant and will include the following information:

- o Logic behind EOP development
- o The EOPs themselves
- o Application of EOPs under multiple failure scenarios

Control room walk-throughs will provide practical experience with the EOPs. During this method of training, the team approach to using EOPs will be stressed.

This walk-through training will concentrate on:

- o Operator responsibilities
- o Information flow
- o Interactions of the operators in the control room

Operators will be referred to control room panel indications and controls in specific emergency scenarios which simulate varying degrees of plant degradation.

Training on the EOPs will be conducted using scenarios on a control room simulator. Scenarios will be developed to utilize a generic simulator. Training will be conducted with all operators performing their normal control room functions. Emphasis will be placed on leadership roles and divisions of responsibilities among the control room staff as applied to the EOPs. To further promote the operator's understanding in the various aspects of the EOPs, team communications and procedural usage techniques will be reinforced during post scenario critique and discussion sessions.

In addition, the plant training and operations staff will participate in the development and execution of refresher training. The training staff will develop the scenarios, observe and evaluate the walk-throughs, and critique the results. All licensed operators will undergo control room walk-throughs using the EOPs during refresher training. The walk-throughs will be conducted either in the control room or a simulator. Realistic scenarios will be developed to ensure that the critical aspects of the EOPs are exercised. The scenarios will be varied sufficiently to ensure the operators do not develop a set pattern of responses to incidents but are able to respond to the symptoms as they develop. Further training needs will be determined from the performance of the operators.

As the EOPs undergo revision, training on minor procedure revisions will be conducted through a program of required readings (self-taught), preshift briefings or lectures in the requalification program. Training on major revisions will be conducted by the use of classroom instruction and walk-throughs in the control room or on a simulator. If operational considerations do not allow control room walk-throughs and a simulator is not available, training on major revisions will be conducted during classroom instruction.



ATTACHMENT 1

COOPER NUCLEAR STATION

GUIDELINE FOR PREPARATION OF EMERGENCY OPERATING PROCEDURES